CRITICAL CRITERIA ON BASIN-RANGE STRUCTURE

As commonly regarded, basin-range mountains constitute an orogenic type by themselves; novel, isostatic, youthful appearing. The hypothesis of their structure is one of the most brilliant concepts in the history of American geology; at the same time it is one of the most fanciful, as the severe testing of a generation amply proves. Singularly enough, the theory had its birth in a district where even its fundamental form seems to be entirely without representation.

At this day and distance the extension of the hypothesis to all the so-called fault-block mountains of the arid regions appears to be not only too broad a generalization, but quite unfortunate. Although I should not wish to be the first to make so sweeping an assertion as lately was done by Dr. Spurr, that no one has ever seen the fault-lines blocking out the desert ranges, his statement is almost literally true, as all recent critical evidence on the subject fully attests.

The attractive feature of Gilbert's theory of basin-range structure was of course the strong support it was thought to give to the now famous hypothesis of isostasy. Concerning some of the fundamental premises, I long ago entertained serious doubts. It has since been fully shown that there was decided error in determining the degree of completeness of the compensation that invalidated the conclusions.

With the challenge of the basin-range hypothesis there has come a demand for citations of concrete examples in support of the theory. Thus far, after the elapse of a full decade and after frequent repetition of the demand, the evidence has not been forthcoming. The Cricket Range, in Utah, recently described in this journal as furnishing a key to the problem, emphasizes this shortcoming. It is not the mere display of profound faulting that is the main desideratum. Abundant evidence of this kind is readily found in nearly every one of the desert ranges. In the majority of cases such faultings are found to have no relations to the present orogeny. Where, according to the hypothesis, the bordering faults should be they are not; but when found they are usually miles out on the intermont plains. The present sharp meeting of mountain and plain is now explained by causes other than dislocation, through ordinary stream-corrasion according to Paige, or through sheet-flood erosion as urged by McGee. Under a title of "Locus of Maximum Lateral Deflation in Desert Ranges" I have called attention to its eolative origin.

By displacement are explained the steep truncations of the transverse ridges of many desert ranges. That these bevelments are really fault-planes bounding the mountain-blocks will have to be more strongly supported than it is now, by direct and unquestionable evidence, before the assertion can be accepted. These rows of truncated ridges seem rather to mark the lines of battle between the plano-rasive advance of eolic degradation from the desert side and the normal stream-corrasion of the more moist mountain areas.

In the light of the recent advances in our knowledge of the prodigious amount of deflation which takes place under climatic conditions of aridity it appears that the generally accepted hypothesis of basin-range structure will have to be abandoned and the origin of the desert mountains ascribed to eolic erosion mainly, rather than to local tectonic displacement.

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NOTE REGARDING THE RELATION OF AGE TO FECUNDITY [1]

In his valuable book on "The Physiology of Reproduction" Marshall,[2] in a section on the relation of age to fecundity, says (p. 590):

> The fecundity of the average individual woman may be described, therefore, as forming a wave, which, starting from sterility, rises somewhat rapidly to its highest point, and then gradually falls again to sterility. There can be no doubt that animals as a general rule tend to follow a similar law.

[1] Papers from the Biological Laboratory of the Maine Agricultural Experiment Station, No. 43.

[2] Marshall, F. H. A., "The Physiology of Reproduction," London (Longmans, Green & Co.), 1910, pp. xvii + 706.